

## **Claims**

*What is claimed is:*

1. A sensor for sensing the presence of an analyte component, which sensor does not  
5 rely on redox mediators, the sensor comprising:  
a substrate that reports reception of mobile charge carriers to an electronic circuit;  
and  
a plurality of active molecular recognition groups wired to a surface of the substrate  
by molecular wires aligned in a non random orientation,  
10 wherein when the analyte component contacts the active molecular recognition  
surfaces, mobile charge carriers are transferred directly to and through the molecular wires  
attached to said headgroup surfaces, without redox reaction in the molecular wires, to  
thereby allow the substrate to sense the presence of the analyte component.